LPS	Licensing, Permitting, and Safety
LWA	Limited Work Authorizations
MSDS	Material Safety Data Sheets
NAICS	North American Industry Classification System
NCRP	National Council on Radiation Protection and Measurements
NPH	Natural Phenomenon Hazard
NRC	U.S. Nuclear Regulatory Commission
NVLAP	National Voluntary Laboratory Accreditation Program
OAR	Operating Authorization Request
OPM	Operational Preventive Measures
OSHA	Occupational Safety and Health Administration
PFD	Process Flow Diagram
PHA	Process Hazards Analysis
PHMC	Project Hanford Management Contractor
PSAR	Preliminary Safety Analysis Report
PSC	Project Safety Committee
PSM	Process Safety Management
QA	Quality Assurance
~~QAIP~~	~~Quality Assurance Program Implementing Plan~~
QAP	Quality Assurance ~~p~~Program
QAPIP	Quality Assurance ~~p~~Program and Implementation ~~p~~Plan
QARD	Quality Assurance Requirements and Description
QL	Quality Level
~~QR~~	~~Quality Requirements~~
RAMI	Reliability, Availability, Maintainability, and Inspectability
RCRA	*Resource Conservation and Recovery Act of 1976*
rem	Roentgen-Equivalent Man
RG	Regulatory Guide
RL	Department of Energy Richland Operations Office
RMP	Risk Management Plan
RPP	Radiation Protection Program
RU	Regulatory Unit
~~SA~~	~~Safety Assessment~~
SAR	Safety Analysis Report
SDC	Safety Design Class
SDS	Safety Design Significant
SER	Safety Evaluation Report
SIXEP	Site Ion Exchange Effluent Plant
SNM	Special Nuclear Material
SPD	System Performance Demonstrations
SRD	Safety Requirements Document
SSC	Structures, Systems, and Components
STD	Standard (also Std)
TSR	Technical Safety Requirement
TEDE	Total Effective Dose Equivalent
THORP	Thermal Oxide Reprocessing Plant
TWRS	Tank Waste Remediation System
TWRS-P	Tank Waste Remediation System-Privatization
UBC	Uniform Building Code
UK	United Kingdom

5) The accident analyses performed to identify engineered and administrative controls required for worker and public safety (ISMP Section 1.3.6, "Accident Analysis")

6) The iteration of the PHA, accident analyses, and design to ensure an adequate level of safety for the workers and the public (ISMP Sections 1.3.7, "Acceptable Level of Public Safety" and 1.3.8, "Acceptable Level of Worker Safety)

7) The development of the technical safety requirements, if required, that are based on

   a) A process variable, design feature, or operating restriction that is an initial condition (i.e., the assumed facility state) for an accident analysis

   b) Structures, systems, and components that must function to maintain compliance with public and worker radiological and chemical exposure standards

8) The development of procedures and training to achieve and maintain the required administrative controls (ISMP Sections 1.3.12, "Training" and 1.3.13, "Procedures")

9) The development of an emergency preparedness program and implementing procedures (ISMP Section 1.3.18,"Emergency Planning")

10) The assignment of design, construction, and operational roles and responsibilities and the use of assessments to ensure the necessary attributes of the ISMP are effectively accomplished (ISMP Chapters 10.0, "Assessments," and 11.0, "Organizational Roles, Responsibilities, and Authorities").

Chapter 1.0 of the ISMP presents the safety approach of the BNFL Team for the TWRS-P Project. Chapters 2.0 through 11.0 are formatted to correspond to the attributes included in RL/REG-97-07, *Guidance for the Review of TWRS Privatization Contractor Integrated Safety Management Plan Submittal Package* (DOE-RL 1997).

Throughout the ISMP, lists of items are numbered for the convenience of the reviewers in referring to individual items. The numbering is not an indication of the importance or sequence of the items.

Chapter 12.0, "Definitions," contains the definitions of some of the terms, phrases, or documents that are found throughout the ISMP. When used unmodified in the ISMP, "worker" refers to the facility and co-located worker, both individually and collectively.

Within this document, the Safety Requirements Document (SRD) (BNFL 1997d), Hazard Analysis Report (HAR) (BNFL 1997b), Quality Assurance Program (QAP) (BNFL 1997a, BNFL 2000), Quality Assurance Program and Implementation Plan (QAPIP) (BNFL 2000), and Initial Safety Analysis Report (ISAR) (BNFL 1997c), are cited using acronyms. Full reference information for these documents appears in Chapter 13.0, "References."

1.2 SUMMARY

The TWRS-P Project safety approach is implemented with the recognition that the defined work of processing and immobilizing Hanford tank waste involves inherent radiological and chemical hazards from which hazardous situations may arise. The BNFL team is integrating the development of Safety Criteria, design requirements, the hazard analysis and accident analysis

unavailability resulting from maintenance activities. Accident prevention and mitigation controls are added to the design as necessary to satisfy the worker accident risk goal.

If credit is taken for operator action to satisfy the worker radiological exposure standards of Table 1-2, adequate radiation protection is provided to permit access and occupancy of the control room or other control locations under accident conditions without personnel receiving radiation exposures in excess of 5 rem whole body gamma and 30 rem beta skin for the duration of the accident. If credit is taken for operator action to satisfy worker chemical exposure to EPRG-2 limits (AIHA 1988), provisions are made so that the operator exposure does not exceed the EPRG-2 limits.

Additional details on the radiological exposure standards applied to the public and workers are provided in *TWRS-P Privatization Project: Radiological and Nuclear Dose Standards for Facility and Co-Located Workers* (BNFL 1997e). This reference also provides information on the basis for the assumed location of the receptors.

1.3.9 Quality Assurance Program

The BNFL team uses its quality assurance program as an important tool in achieving the goal of the safe operation of the TWRS-P Facility. The QAP ~~describes~~ defines the organizational structure, functional responsibilities, levels of authority, and interfaces for those managing, performing, and assessing the work to be performed.~~-~~

The BNFL team developed its quality assurance program (QAP) in compliance with the requirements of 10 CFR 830.120, Quality Assurance Requirements, so the integration of the QAP for the TWRS-P Project began during the initial phases of the project. The QAP for Part A has been submitted to and approved by the U.S. Department of Energy (DOE) (BNFL 1997a, Sheridan 1997). The QAP for Part B activities has been submitted to DOE; ~~(BNFL 1998c)~~ the current version (BNFL 2000) has been approved by the DOE Regulatory Unit (Gibbs 2000). As a result of early development of the QAP, the PHA, SRD, and HAR were developed in accordance with the requirements in the QAP. The application of the requirements of the QAP continues during design, procurement, construction, startup, testing, inspections, operations, maintenance, modifications, and deactivation of the facility. Administrative processes such as training, procedure development, and configuration management are subject to the requirements of the QAP. The QAP is used by the BNFL team to ensure that all aspects of the integrated safety approach have been implemented for the TWRS-P Project.

The ~~program~~ QAP requires periodic assessments of activities, both by management and by knowledgeable, independent personnel, as described in QAP sections 9 and 10~~from design through deactivation~~. ~~System~~ The conduct of audits ~~are conducted~~ to objectively evaluate the effectiveness and proper implementation of the QAP for activities affecting quality of SSCs and~~-~~ ~~S~~surveillances of specific project activities (e.g., process controls, preparation of safety documentation, configuration and document control, and records management) ~~is conducted~~ to supplement the compliance audit program ~~to quickly determine compliance of activities to program requirements~~are also described in the QAP. The QAP also describes the process of qualifying personnel who perform assessments, audits, and surveillances, as well as documentation of results and review by management.

Performance monitoring is used to verify that the necessary programs, plans, and procedures are functioning to ensure that activities are maintained in compliance with the applicable requirements. The findings of performance monitoring are used to determine if changes are needed to ensure that the high standards of performance expected by the BNFL team are achieved.

~~Assessment, audits, and surveillance are performed in accordance with procedures by qualified personnel. Results are documented and reviewed by management with responsibility in the areas being audited.~~ The QAP ensures that identified corrective actions are implemented and

any follow-up actions, such as the performance of a re-audit of a deficient condition, are conducted.

Different aspects of the implementation of the QAP are discussed in the following parts of the ISMP:

1) Chapter 2.0 “Compliance with Laws and Regulations”
2) Section 3.5 “Quality Assurance Program”
3) Section 5.4 “Compliance Audits”
4) Chapter 10.0 “Assessments”.

~~The scope and the details of the QAP are further discussed in the ISAR Chapter 3.3, “Quality Assurance.”~~

1.3.10 Classification of Structures, Systems, and Components

The design classification process used on the TWRS-P Project provides a consistent, project-wide approach for the classification of the TWRS-P Facility SSCs based on their importance to controlling normal releases and accident prevention and mitigation. This approach ensures that SSCs are designed, constructed, fabricated, installed, tested, operated, and maintained to quality standards commensurate with the importance of the functions that need to be performed. As the facility moves to deactivation, and the safety functions change, the classification of SSCs will be revised as necessary.

BNFL Inc. has established a design classification system to provide assurance to DOE that the defined safety functions of SSCs will perform as intended.

In this system, SSCs are designated as Important-to-Safety in accordance with the definition of this term as provided in *Top-Level Radiological, Nuclear, and Process Safety Standards and Principles for TWRS Privatization Contractors* (DOE-RL 1996b).

SSCs defined as Important-to-Safety for the TWRS-P Facility include the following.

1) SSCs needed to prevent or mitigate accidents that could exceed public or worker radiological and chemical exposure standards of Table 1-2 and SSCs needed to prevent criticality. This set of SSCs includes both the front line and support systems needed to meet these exposure standards or to prevent criticality. This set of Important-to-Safety SSCs are designated as Safety Design Class.

2) SSCs needed to achieve compliance with the radiological or chemical exposure standards for the public and workers during normal operation; and SSCs that place frequent demands on, or adversely affect the function of, Safety Design Class SSCs if they fail or malfunction. This set of Important-to-Safety SSCs are designated as Safety Design Significant.

The processes for identifying the SSCs for each of the two groups of SSCs Important-to-Safety and the requirements assigned to each of the two groups are discussed below.

Safety Design Class SSCs typically are identified by the results of accident analyses that show the potential for exposure standards to be exceeded. However, additional items also are

designated Safety Design Class independent of a specific accident analysis. These are items that protect the facility worker from potentially serious events. Typically, these events are deemed to present a challenge to the facility worker severe enough that mitigation is prudent, without the need to perform a specific consequence analysis. These latter items are identified by the results of the HAR.

Safety Design Significant SSCs are identified in several ways including: (1) SSCs identified as significant contributors to safety by the risk analyses that confirm the facility accident risk goals are met (this is one way to identify SSCs that place frequent demands on, or adversely affect the function of, Safety Design Class SSCs if they fail or malfunction), (2) SSCs that are needed to ensure that standards for normal operation are not exceeded (e.g., bulk shield walls or radiation monitors), (3) SSCs selected based on the dictates of nuclear and chemical facility experience and prudent engineering practices, and (4) SSCs whose failure could prevent Safety Design Class SSCs from performing their safety function (e.g., Seismic II/I items).

SSCs identified in ISAR Section 4.8, "Controls for Prevention and Mitigation of Accidents" as Design Class I and II are Safety Design Class SSCs. SSCs provided to protect the health and safety of the public and co-located workers usually are considered to also provide adequate protection of the environment. As stated in ISAR Section 4.8, "The selection of engineered and administrative controls is based on the conceptual design of the facility. Additional or different features may be identified during Part B." The more complete group of Important-to-Safety SSCs will be identified in Part B and provided in the Preliminary Safety Analysis Report (PSAR) as part of the Construction Authorization Request. The PSAR and the Final Safety Analysis Report also will describe SSCs that are not designated as Important-to-Safety. The descriptions of these SSCs will note that they are not classified as Important-to-Safety.

When a SSC is designated as Safety Design Class it has the following attributes:

1) Quality Level 1 (QL-1) is applied to the SSC. ~~ISMP Section 1.3.11, "Quality Levels" and Table 1-3~~The QAP describes the requirements associated with QL-1.

2) For an active system or component, the safety function is preserved by application of defense-in-depth such that failure of the system or component will not result in exceeding a public or worker accident exposure standard. For a mitigating feature, this means that, given that the accident has occurred, the consequence of the accident will not result in exceeding a public or worker exposure standard. For a preventative feature, this means that the failure of the system or component will not allow the accident to occur and progress such that a public or worker accident exposure standard is exceeded. This requirement may be achieved by designing the Safety Design Class system or component to withstand a single active failure or by designating two separate and independent systems or components as Safety Design Class.

3) The SSC is designed to withstand the effects of natural phenomena such that it can perform any safety functions required as a result of a natural phenomena event. For example, if an earthquake can produce exposures to the public or workers in excess of standards, the Safety Design Class SSC that prevents or mitigates the exposures would be designed to be DBE-resistant and designated as Seismic Category I. However, DBE-resistance is not applied automatically to Safety Design Class SSCs. It is applied only when the earthquake is the initiating event, or when the earthquake could cause the

initiating event. A Safety Design Class SSC that does not have a DBE mitigating function is designated as Seismic Category III.

This natural phenomenon hazard (NPH) design philosophy is used for all severe natural phenomena events (i.e., earthquake, flood, high wind). Therefore, if a Safety Design Class SSC is needed for meeting public or worker exposure standards for a given NPH event, the NPH loads associated with that event are taken from SRD Volume II, Table 4-1, "Natural Phenomena Design Loads for Important-to-Safety SSCs with NPH Safety Functions." All other NPH loads for the Safety Design Class SSC may be taken from SRD Volume II, Table 4-2, "Natural Phenomena Design Loads for SSCs without NPH Safety Functions" in lieu of SRD Table 4-1.

4) General design requirements are applied as identified in Section 4.0 of the SRD for Safety Design Class SSCs. See SRD Safety Criterion 4.1-5 as an example.

5) Specific design requirements based on the type of component are applied as invoked in SRD Chapter 4.0. For example, SRD Safety Criterion 4.4-5 provides requirements associated with Safety Design Class air treatment systems.

6) Other design requirements may be applied based on the specific safety function to be performed by the Safety Design Class SSC. This specific safety function is determined from the accident analysis that identified the need for prevention or mitigation by Safety Design Class SSCs.

7) Operational requirements (e.g., periodic testing and preventative maintenance) are applied to Safety Design Class SSCs through the application of Technical Safety Requirements (discussed in ISMP Section 4.2.3.4 "Technical Safety Requirements").

When a SSC is classified as Safety Design Significant it is has the following attributes.

1) Quality Level 2 (QL-2) is applied to the SSC. ~~ISMP Section 1.3.11, "Quality Levels" and Table 1-3~~The QAP describes the requirements associated with QL-2.

2) The SSC is designed to withstand the effects of natural phenomena such that it can perform its safety functions required as a result of a natural phenomena event. If an earthquake can produce exposures to the public or workers in excess of standards, the Safety Design Class SSC that prevents or mitigates the exposures would be designed DBE-resistant as discussed above. The same NPH loads also are applied to a Safety Design Significant SSC if failure of the item could prevent the Safety Design Class SSC from performing its safety function required as a result of the DBE. Such an SSC is designated Seismic Category II. It should be noted, however, that DBE resistance is not automatically applied to Safety Design Significant SSCs. It is applied only when the earthquake is the initiating event, or when the earthquake could cause the initiating event. A Safety Design Significant SSC that does not have a DBE mitigating function is designated Seismic Category III.

This NPH design philosophy is used for all severe natural phenomena events (i.e., earthquake, flood, high wind). Therefore, if a Safety Design Significant SSC is needed to meet public or worker exposure standards for a given NPH event, the NPH loads associated with that event are taken from SRD Volume II, Table 4-1, "Natural

Table 1-3. Application of Quality Assurance Program Requirements for QL-1, QL-2, and QL-3 Structures, Systems, and Components. (Sheet 1 of 4)

QAP Requirement	QL-1	QL-2	QL-3	Remarks
1. Program				
• A written Quality Assurance Program (QAP) shall be developed, implemented, and maintained.	X	X	Xa	A QAP describing selected criteria (as applicable) of 10 CFR 830.120 is acceptable for QL-3.
• The QAP shall describe the organizational structure, functional responsibilities, levels of authority, and interfaces for those managing, performing, and assessing the work.	X	X		
• The QAP shall describe management processes, including planning, scheduling, and resource considerations.	X	X		
2. Personnel Training and Qualification				
• Qualification of personnel: policies and procedures that describe personnel selection requirements shall be established for each position.	X	X	Xa	
• Training shall provide knowledge of the correct processes and methods to accomplish assigned tasks.	X	X		
• Training goals, lesson plans, and other training materials shall be developed, reviewed by subject matter experts, and approved by management.	X	X		No formal training programs required for QL-3.
• Training effectiveness shall be monitored. Worker performance shall be evaluated to ensure that the training program conveys all required knowledge and skills.	X	X		
3. Quality Improvement				
• Process to detect and prevent quality problems shall be established and implemented.	X	X		Commercial practices for QL-3.
• Items, services, and processes that do not meet established requirements shall be identified, controlled, and corrected according to the importance of the problem and the work affected.	X	X		Commercial practices for QL-3.
• Correction shall include identifying the causes of problems and working to prevent recurrence.	X	X		Commercial practices for QL-3.
• Item characteristics, process implementation, and other quality-related information shall be reviewed and the data analyzed to identify items, services, and processes needing improvement.	X	X		Commercial practices for QL-3.1.

Table 1-3. Application of Quality Assurance Program Requirements for QL-1, QL-2, and QL-3 Structures, Systems, and Components. (Sheet 2 of 4)

QAP Requirement	QL-1	QL-2	QL-3	Remarks
4. Documents and Records				
• Documents shall be prepared, reviewed, approved, issued, used, and revised to prescribe processes, specify requirements, or establish design.	X	X		Commercial practices for QL-3.
• Records shall be specified, prepared, reviewed, approved, and maintained.	X	X		Commercial practices for QL-3.
5. Work Processes				
• Work shall be performed to established technical standards and administrative controls using approved instructions, procedures, or other appropriate means.	X	X		Commercial practices for QL-3.
• Items shall be identified and controlled to ensure their proper use.	X	X		Commercial practices for QL-3.
• Items shall be maintained to prevent their damage, loss, or deterioration.	X	X		Commercial practices for QL-3.
• Equipment used for process monitoring or data collection shall be calibrated and maintained.	X	X		Commercial practices for QL-3.
6. Design				
• Design inputs shall be technically correct and complete. These inputs may include such information as design bases, health and safety considerations, performance parameters, codes and standards requirements, and reliability requirements.	X	X		Commercial design practices for QL-3.
• Technical design interfaces shall be identified in the input documents and methods shall be established for their control.	X	X		Commercial design practices for QL-3.
• The design process shall translate design input into design output documents that are technically correct and meet the end-user's requirements.	X	X		Commercial design practices for QL-3
• Aspects critical to the safety or reliability of the designed system, structure, or component shall be identified during the design phase.	X	X		Commercial design practices for QL-3
• Computer software verification and validation.	X	X		Computer software validation and verification is not required for QL-3.
• The completed design shall be recorded in design output documents such as: drawings, specifications, test/inspection plans, maintenance requirements, and reports.	X	X	Xa	QL-3: drawings, specifications, calculations only.

Table 1-3. Application of Quality Assurance Program Requirements for QL-1, QL-2, and QL-3 Structures, Systems, and Components. (Sheet 3 of 4)

QAP Requirement	QL-1	QL-2	QL-3	Remarks
6. Design (continued)				
• Design verification is a formal documented process to establish that the resulting system, structure, or component will be fit for the intended use. Design verification methods include, but are not limited to, technical reviews, peer reviews, alternate calculations, and qualification testing.	X	X		Commercial design practices for QL-3.
• The adequacy of design products shall be verified or validated by individual or groups other than those who performed the work.	X	Xa		Commercial design practices for QL-3.
• Design changes, including field changes and nonconforming items dispositioned use-as-is or repair, shall be controlled by measures commensurate with those applied to the original design.	X	X		Commercial design practices for QL-3.
• Temporary modifications shall receive the same levels of control as the designs of permanent modifications.	X	X		Commercial design practices for QL-3.
7. Procurement				
• Prospective suppliers shall be evaluated and selected on the basis of specified criteria.	X	X		Commercial practices for QL-3.
• Procurement documents shall clearly state test/inspection requirements and acceptance criteria for purchased items and service.	X	X		Commercial practices for QL-3.
• Supplier Monitoring.	X	Xa		
• Receipt Inspection.	X	X	X	
• Reporting Non-conformances.	X	X	X	
• Product Documentation: Supplier generated documents that are important to the product quality shall be accepted through the procurement system and controlled; these documents may include certificates of conformance, drawings, analysis, test reports, maintenance data, non-conformances, corrective actions, approved changes, waivers, and deviations.	X	X	Xa	

Table 1-3. Application of Quality Assurance Program Requirements for QL-1, QL-2, and QL-3 Structures, Systems, and Components. (Sheet 4 of 4)

QAP Requirement	QL-1	QL-2	QL-3	Remarks
8. Inspection and Acceptance Testing				
• Inspection and testing of specified items, services, and processes shall be conducted using established acceptance and performance criteria.	X	X	Xa	
• Equipment used for inspections and test shall be calibrated and maintained.	X	X	Xa	
9. Management Assessment				
• Managers shall assess their management processes. Planned and periodic management assessments shall be established and implemented. Problems that hinder the organization from achieving its objectives shall be identified and corrected.	X	X		Commercial practices for QL-3.
10. Independent Assessment				
• Independent assessments shall be planned to measure item and service quality.	X	X		Commercial practices for QL-3.
• The group performing independent assessment shall have sufficient authority and freedom from the line organization to carry out its responsibilities.	X	X		
• Persons conducting independent assessments shall be technically qualified and knowledgeable in the areas assessed.	X	X		

X = Full application of the QAP Requirement
Xa = Graded application of QAP Requirements

Phenomena Design Loads for Important-to-Safety SSCs with NPH Safety Functions." All other NPH loads for the Safety Design Significant SSC may be taken from SRD Volume II, Table 4-2, "Natural Phenomena Design Loads for SSCs without NPH Safety Functions" in lieu of SRD Table 4-1.

3) General and specific design requirements are applied as identified in Section 4.0 of the SRD for Safety Design Significant SSCs.

4) Other design requirements again may be applied based on the specific safety function to be performed by the Safety Design Significant SSC.

1.3.11 Quality Levels

The assignment of Quality Levels (QL) is the method by which the BNFL team ensures the implementation of the graded quality approach discussed in 10 CFR 830.120, "Quality Assurance Requirements." Designation of correct quality levels helps to ensures that the appropriate quality assurance requirements are applied to specific TWRS-P Facility SSCs. The three quality levels of the TWRS-P Project quality assurance approach and their applications are described as follows in the QAP.

Safety Design Class

Quality Level 1 (QL-1) requirements are applied to Safety Design Class SSCs to provide added assurance that the SSCs can perform their specified safety function.

Safety Design Significant

Quality Level 2 (QL-2) requirements are applied to Safety Design Significant SSCs to provide adequate assurance that the SSCs can perform their specified function.

Other SSCs (those SSCs that are neither Safety Design Class nor Safety Design Significant)

Quality Level 3 (QL-3) requirements, consisting of sound commercial practices and compliance with industry codes and standards, are applied to these SSCs.

Table 1-3 presents a tabular summary of the application of QAP requirements for QL-1, QL-2, and QL-3 SSCs.

1.3.12 Training

Training serves an important role in the TWRS-P Project by ensuring that the personnel involved with the project have sufficient knowledge to safely fulfill the roles and responsibilities of their assigned tasks. Training has a direct impact on safety during design, construction, operation, and deactivation of the project by:

1) Improving technical ability

2) Enhancing personal skills

3) Increasing awareness of signs of potential hazardous situations in the workplace

4) Increasing personal awareness of the potential impact of actions taken with regard to the safety of the individual, others, and the facility

5) Establishing a safety culture that clearly assigns the responsibility for safety to the individual.

During the design and construction phases of the project, the training focus is on the requirements such as design evolution, compliance with regulations and commitments, construction activities, and quality assurance.

Operator training and qualification is of specific importance in the training program. The operator training program is enhanced by the experience of the BNFL team at other similar facilities and by the information made available during the design phase and the startup testing program. In addition, operation of the demonstration plants provides invaluable training opportunities for the facility operators.

In recognition that different training is required for different assignments, the training plan addresses the assessment of training requirements and responsibilities and the evolution of the training plan required as the project matures. Additional information on training is provided in ISMP Section 3.15 "Training and Qualification" and Section 4.2.2, "Training and Procedures." The training plan is described in ISAR Section 3.4, "Training and Qualification."

1.3.13 Procedures

Procedures are one tool by which compliance with requirements is ensured during the design, construction, operation, and deactivation of the project. All activities that may affect safety of the public and workers are performed in accordance with step-by-step instruction provided in procedures. The range of activities covered in procedures includes, but is not limited to:

1) Design control
2) Procurement activities
3) Monitoring contractors
4) Identification and resolution of nonconforming conditions
5) Operations and maintenance
6) Emergency plan implementing procedures.

There is a defined hierarchy of procedures commensurate with the philosophy used to developed the tailored levels of design classification and quality levels. For example, procedures supporting the implementation of Technical Safety Requirements that are credited for accident prevention or mitigation will have a greater safety significance than procedures supporting maintenance activities on other SSCs ~~(as defined in ISMP Section 1.3.11, "Quality Levels")~~. Those procedures, at the highest level, are subject to increased rigor with respect to their development, review, implementation, and change. Increased rigor includes requirements for independent review and approval by qualified and experienced personnel or safety committees. Training emphasizes the importance of the hierarchy as well as the content of the procedures and the requirement to follow procedures to ensure safe and efficient activities.

6) Temporary relief is appropriate while a program to meet requirements is being implemented. (This item would not be considered prior to operation of the TWRS-P Facility.)

Actions necessary to achieve compliance with laws and regulations are included in the configuration management program, which includes the identification of the need to document changes to the authorization basis. Proposed changes to the authorization basis are subjected to the unreviewed safety question (USQ) evaluation process and evaluation for potential impact on the authorization basis. The USQ process is described in detail in the Initial Safety Analysis Report (ISAR) Section 3.1, "Configuration Management." The configuration management program ensures that the TWRS-P Project establishes and maintains consistency among design requirements, physical configuration, facility operation, and facility documentation through the deactivation of the TWRS-P Facility.

A change being made to the TWRS-P Facility technical baseline configuration relating to areas of the site; structures, systems and components (SSCs); staffing; procedures; training, and computer software are performed, reviewed, and documented in accordance with procedures to ensure that a high level of protection is maintained for the public, workers, and environment. Additional information on the TWRS-P Project configuration management program is provided in Integrated Safety Management Plan (ISMP) Section 1.3.16, "Configuration Management," and Section 5.3, "Configuration Management." Details on the TWRS-P Project configuration management program are provided in ISAR Section 3.1, "Configuration Management."

2.2 COMPLIANCE WITH 10 CFR 830.120, "QUALITY ASSURANCE REQUIREMENTS"

The TWRS-P Project quality assurance program (QAP) is implemented to ensure that the design, procurement, construction, testing, inspection, operation, maintenance, and deactivation activities conform to regulatory and contractual requirements. The QAP for Part A has been submitted to and approved by the U.S. Department of Energy (DOE) (BNFL 1997a, Sheridan 1997). The QAP for Part B activities has been submitted to~~, and approved by~~ DOE ~~(BNFL 1998c)~~and has been revised several times. The current version (BNFL 2000) has been approved by the DOE Regulatory Unit (Gibbs 2000).

The QAP for the TWRS-P Project meets the requirements of 10 CFR 830.120, "Quality Assurance Requirements," as presented in BNFL-5193-QAP-01, ~~*Tank Waste Remediation System Privatization Project*~~ *Quality Assurance Program and Implementation Plan* (BNFL ~~1998c~~2000). The implementation plan required by the 10 CFR 830.120 rule is included as an appendix to the Quality Assurance Program for Part B activities (BNFL ~~1998c~~2000).

Adherence to the TWRS-P Project QAP ensures the following:

1) Missions and objectives are effectively accomplished.

2) Products and services provide their required safety functions and meet or exceed the requirements and expectations of the TWRS-P Project regulator. Products and services that do not meet requirements are identified, controlled, and corrected (including identification of the cause and corrective action).

3) Hazards to workers, the public, and the environment are minimized

4) Prospective suppliers are evaluated and selected on the basis of specified criteria.

The process by which the QAP is integrated into TWRS-P Project activities is discussed in ISMP Section 1.3.9, "Quality Assurance Program," and Section 3.5, "Quality Assurance Program." Updating the QAP is addressed in ISMP Section 3.3.3, "Changes to the Authorization Basis." Safety Requirements Document (SRD) Volume II, Section 7.3, "Quality Assurance Program (QAP)," provides criteria for the QAP. ~~ISAR Section 3.3, "Quality Assurance," describes the essential features of the QAP and planned actions to demonstrate and ensure that the TWRS-P Project meets the requirements of 10 CFR 830.120 as presented in BNFL-5193-QAP-01 (BNFL 1997a and 1998c). ISAR Section 3.3 also relates activities to quality by organizations that provide equipment, services, and support to the TWRS-P Project.~~

2.3 COMPLIANCE WITH 10 CFR 835, "OCCUPATIONAL RADIATION PROTECTION"

Implementation of 10 CFR 835, a potential exemption request from this regulation, and the radiation protection program are described in this section.

2.3.1 Implementation of 10 CFR 835

BNFL Inc. will be in full compliance with 10 CFR 835. A radiation protection program that implements the requirements of 10 CFR 835 and additional requirements specified in SRD Volume II Chapter 5.0 "Radiation Protection" is established. The program includes the following components:

1) Implementation of the as low as reasonably achievable (ALARA) design goal

2) Development of the Radiation Protection Program (RPP) and implementing procedures

3) Training of personnel to the RPP and procedures

4) Selection of qualified personnel to ensure safe work performance in radiological environments

5) Maintenance of records

6) Performance of reviews and audits

7) Implementation of a lessons-learned program

8) Respiratory protection

9) Sealed sources

10) Solid radioactive waste storage, packaging, and handling.

Details on these administrative controls is provided in ISAR Chapter 3.0, "Conduct of Operations," and Chapter 5.0, "Radiation Safety."

Updating of the RPP is addressed in ISMP Section 3.3.3, "Changes to the Authorization Basis."

The provisions of the Quality Assurance Requirements and Description document DOE/RW/0333P will be applied ~~to QL-1 and QL-2 items and activities associated with HLW services from design through production and acceptance~~as described in the QAP.

The objectives of the ~~TWRS-P Project~~ QAP ~~is~~ are ~~to~~ to:

a) establish the project organizational structure, management controls, functional responsibilities, levels of authority, and interfaces for managing, performing, and assessing the work; ~~planned~~ and ~~systematic actions necessary to achieve the defined work of the TWRS-P Project in a safe, consistent, and reliable manner~~

b) ensure confidence in the safe completion of project work in full compliance with radiological, nuclear, and process safety requirements, waste product acceptance quality requirements, and mission objectives.~~-~~

Adherence to the DOE-approved QAP also ensures the following.

1) DOE mission and objectives related to TWRS-P Project are effectively accomplished.

2) Products and services are safe, reliable, and meet or exceed the requirements and expectations of the user.

3) Hazards to the public and workers are minimized.

The extent to which quality requirements are applied to the TWRS-P Project is based on a graded approach, reflecting the safety implications of the activity. Quality-related activities performed by organizations providing equipment, services, or support to the TWRS-P Project are conducted in accordance with the requirements documented in the approved QAP.

Additional information on the QAP is provided in ISMP Section 3.5, “Quality Assurance Program (QAP).” Additional information on the audit and management assessment aspect of the QAP is provided in ISMP Section 5.4, “Compliance Audits,” and Chapter 10.0, “Assessments.”

3.3.1.6 Radiation Protection Program (RPP). The occupational RPP documents the program standards, requirements, administrative controls, responsibilities, and authorities associated with the scope of TWRS-P Facility radiological activities. The RPP is the program required by 10 CFR 835, “Occupational Radiation Protection.” The RPP provides the regulatory technical basis that ensures the radiological safety of facility workers, co-located workers, facility visitors, and the onsite members of the public. Additional information on the RPP is provided in ISMP Section 2.3, “Compliance with 10 CFR 835, Occupational Radiation Protection.” The outline for the RPP included in ISAR Appendix 5A, “Radiation Protection Program Outline,” has been developed to facilitate transition to U.S. Nuclear Regulatory Commission (NRC) as the regulator and the need to comply with 10 CFR 20, “Standards for Protection Against Radiation.”

3.3.1.7 Emergency Plan. The Emergency Plan, describing the provisions for responses to operational emergencies, documents the TWRS-P Emergency Management Program. All aspects of the TWRS-P Project Emergency Management Program (EMP) as required by DOE and applicable federal, state, and local requirements are addressed. The EMP, an element of an integrated and comprehensive DOE Emergency Management System (EMS) (DOE 1995a), is designed to address emergency planning, preparedness, response, recovery, and readiness assurance activities. The DOE system considers emergency conditions that might place individuals at risk; which goes beyond radiological hazards. In addition, the relationships of the EMP to existing DOE Headquarters, DOE Richland Operations Office, and Hanford Site Contractors' programs, are documented in the TWRS-P Project Emergency Plan. A discussion of critical interfaces and the division of responsibility among these different agencies is included in the Emergency Plan. The elements of the Emergency Plan are designed to ensure that the TWRS-P Project, as part of the overall DOE EMS, is prepared to respond promptly, efficiently, and effectively to any emergency to protect the public and workers.

The Emergency Plan ensures that emergency response requirements are considered throughout the planning and design process. Emergency drills and exercises are performed to evaluate the emergency plans and TWRS-P Facility staff response to offnormal conditions. The exercise program includes coordination with Hanford Site, state, and local emergency response organizations. The TWRS-P Project will participate in Hanford Site exercises and drills for other facilities as invited.

The Emergency Plan is submitted to support the request for an operating authorization. Chapter 9.0, "Emergency Management," of the PSAR will address emergency preparedness as required to support the construction authorization request. Procedures developed by the TWRS-P Facility construction manager implement state and federal emergency preparedness requirements for hazardous situations that may arise during construction.

Additional information on the Emergency Plan is provided in ISMP Section 3.10, "Emergency Preparedness."

3.3.1.8 Other Information. Other documents generated by the regulator or BNFL Inc. may become part of the authorization basis for the TWRS-P Project. This includes correspondence concerning the safety aspects of the facility design, construction, operation, and plans for deactivation. Those portions of the Part A Hazard Analysis Report (HAR) that constitute bounding or significant hazards or hazardous situations are considered to be part of the authorization basis. It also includes the Employee Concerns Program.

3.3.2 Control of the Authorization Basis

The authorization basis for TWRS-P Facility is considered as an element of the technical baseline for the facility. Changes to the technical baseline are managed by a configuration management program. For further information concerning configuration management see ISMP Sections 1.3.16 and 5.3, "Configuration Management."

3.3.3 Changes to the Authorization Basis

Changes to the authorization basis include changes to the facility design and administrative controls (e.g., procedures, programs, plans, or management processes) that are described in the authorization basis or are relied on to ensure conformance to the authorization basis. Changes to the authorization basis are managed by a configuration management program discussed in ISMP Sections 1.3.16 and 5.3, "Configuration Management." As described in these sections, the change management program includes the use of qualified personnel, procedures developed and approved under the TWRS-P Project procedure process, and implementation under the approved QAP.

By 10 CFR 830.120(b)(3), a contractor may, at any time, make changes to the approved QAP so long as the QAP, as changed, will continue to satisfy the requirements of 10 CFR 830.120. For the TWRS-P Project the commitment has been made that changes to a previously approved QAP will be submitted to the Regulatory Unit for review and approval 30 days prior to the implementation of the subject changes. Annual updates to the QAP must identify the changes, the pages affected, the reason for the changes, and the basis for concluding that the revised QAP continues to satisfy the requirements of 10 CFR 830.120. These annual updates are also subject to the 30-day prior review by the Regulatory Unit.

The safe completion of a quality job requires planning that takes into consideration aspects such as adequate work packages, appropriate level of instructions, evaluation of the impact of the task on other SSCs or processes, and an evaluation of the completed activity. Procedures governing these activities specify that trained and qualified personnel are required to participate in planning process. This includes craft and operations personnel supporting technical and administrative workers.

To ensure that safety and quality procedures are being followed and that the implemented procedures are adequate to facilitate achieving the expectations, assessments of work activities performed and the results of compliance with goals are conducted. Where practices are identified that improve safety and quality, those practices are incorporated into operations. Any required corrective actions identified are tracked to completion. Results of these assessments are provided to managers and workers.

As the project moves through design and operations to deactivation, the BNFL team revises the goals and procedures to reflect the activities required for each phase.

3.5 QUALITY ASSURANCE PROGRAM (QAP)

The TWRS-P Project QAPs for Part A and B activities, which were developed to meet the criteria of 10 CFR 830.120, "Quality Assurance Requirements," have been submitted to, and approved by the Regulatory Unit (BNFL 1997a, BNFL ~~1998c~~2000). Implementation of 10 CFR 830.120 is addressed in ISMP Section 2.2, "Compliance with 10 CFR 830.120, "Quality Assurance Requirements. The implementation plan required ~~of~~ by 10 CFR 830.120 is included as an attachment to the Quality Assurance Program for Part B activities (BNFL ~~1998c~~2000).

Integration of the QAP into the TWRS-P Project safety approach began with the PHA, SRD, and HAR developed by specific procedures in accordance with the requirements of the QAP. This included the establishment of personnel training and qualification requirements, confirmation that personnel met the training and qualification requirements, application of technical review, and documentation of results. The performance of the accident analysis and the comparison of the results of the analysis to the radiological and chemical exposure standards is also performed in accordance with the requirements of the QAP. This includes training and qualification requirements; computer code verification; independent review of input assumptions, analytical methods, and calculations; maintenance of a calculation log; and documentation of the results.

The application of the QAP to design, procurement, construction, testing, inspection, modification, and maintenance of SSCs credited with public and worker safety is discussed in ~~ISMP Section 1.3.11, "Quality Levels."~~the QAP. The manner in which requirements of the QAP are imposed on subcontractors is discussed in ~~ISMP Section 5.2, "Control of Subcontractors."~~the QAP.

Personnel training and qualification and procedure development credited for public and worker safety during facility operation are developed in accordance with the requirements of the QAP. ~~Details on the application of the QAP to training, qualification, and procedure development are provided in the Initial Safety Analysis Report (ISAR) Section 3.3, "Quality Assurance."~~ The QAP is applied to the Emergency Management Program in the areas of training and qualification of emergency response team members, assessment of the program effectiveness, and records documentation. Additional details on these aspects of the emergency response program are provided in ISAR Chapter 9.0, "Emergency Management."

TWRS-P Project compliance with DOE/RW-0333P*, Quality Assurance Requirements and Descriptions for the Civilian Radioactive Waste Management Program (QARD)* (DOE 1995b) is addressed in ISMP Section 3.3.1.5 "Quality Assurance Program (QAP)." The provisions of the Quality Assurance Requirements and Description document DOE/RW/0333P will be applied ~~to QL-1 and QL-2 items and activities associated with HLW services from design through production and acceptance~~as described in the QAP.

ISMP Section 5.3, "Configuration Management," Section 5.4, "Compliance Audits," and Section 8.0, "Document Control and Maintenance" provide additional information on the application of the QAP to the TWRS-P Project safety approach.

3.6 FACILITY DESIGN FOR POSTULATED EVENTS

This section describes the facility design for normal operation, anticipated operational occurrences, and accident conditions.

3.6.1 Normal Operations

The facility design provides for control of radiological exposure to the public and worker such that the exposures are within the standards provided in Table 1-2 for normal events. In addition, the design satisfies the Operations Risk Goal of *Top-Level Radiological, Nuclear, and Process Safety Standards and Principles for TWRS Privatization Contractors*, DOE/RL-96-0006 (DOE-RL 1996b) and of SRD Volume II, Safety Criterion 1.0-4. Those SSCs required for achieving compliance with the public and worker exposure standards for normal operation are designated as Important-to-Safety Safety Design Significant as discussed in ISMP Section 1.3.10, "Classification of Structures, Systems, and Components."

The design of all BNFL facilities is based on operating and maintenance philosophies that ensure efficient process operation while safely protecting the public and workers, and the environment. These philosophies are based on design methods and features that have evolved with the construction and operation of facilities to ever more stringent workforce, public, and environmental protection targets, at BNFL sites over the past 15 years.

The process follows a logical approach, beginning with defining the basis of design and developing the overall process flowsheet. System-specific flow diagrams, such as ventilation flow diagrams, are also developed if required. The next stage is the production of operation and maintenance philosophy documents for each area of the facility, tied together by an overall control philosophy document. These documents define the design principles for each area and allow specific equipment selection or design to commence. These principles are based on existing successful operation of structures, systems, and components. However, where a new process or system that has the potential to provide a cost-effective and safe alternative is identified, a research and development program is initiated to support the design process.

Flow diagrams and documents are subject to review during their development, addressing different aspects of the design. The Technical Organization ensures a consistent design approach is taken across the project and that all of the project requirements are being addressed. The PHA team, which includes representatives from operations, reliability, and relevant technical disciplines, addresses each component of the design from a safety and operability aspect.

accordance with 10 CFR 835 and additional criteria provided in SRD Volume II, Chapter 2.0, "Radiological and Process Standards," and Chapter 5.0 "Radiation Protection" (BNFL 1997d).

These features are provided in a manner that facilitates transition to the NRC as the regulator, including the need to comply with the requirements of 10 CFR 20, "Standards for Protection Against Radiation."

A set of radiation protection drawings is prepared showing the facility zoning and the minimum shielding requirements and access control features. The requirements are incorporated into the facility layout and civil and structural design documents. These documents are reviewed to ensure that the requirements are met. Details, such as penetrations are analyzed to ensure that potential streaming paths are identified and properly shielded.

3.9.1.3 Radiation Monitoring. Fixed area radiation monitoring is provided in areas where the area exposure rates may change suddenly. These sudden changes may be a result of process operation or maintenance activities. Continuous air monitors are provided in accessible locations where concentrations of airborne radionuclides may vary. Air sampling capability is also provided. Effluent sampling is provided as necessary to demonstrate compliance with regulations. The radiation monitoring locations are shown on the radiation protection drawings developed during detailed design.

3.9.2 ALARA Design

Project procedures are established to implement an ALARA program. These procedures include guidance on ALARA design considerations appropriate to the facility and delineate the ALARA design responsibilities of individuals on the project. The ALARA guidance is derived from operating experience at the BNFL Sellafield Site and from industry standards such as NRC Regulatory Guide 8.8, *Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Stations will be As Low as is Reasonably Achievable* (NRC 1978). The BNFL corporate program for ALARA is documented in the company Health and Safety Manual Code of Practice #20, "Application of ALARA to the Routine Radiation Exposure of Workers and the Public." The ALARA guidance addresses considerations for reducing exposures within the TWRS-P Facility from operations and from final decommissioning activities. It also addresses considerations for reducing effluents from the TWRS-P Facility.

ALARA design criteria and ALARA design considerations are provided to project staff in controlled documents. These criteria and considerations are arranged by topic area (for example, General Criteria, Dose Criteria, Environmental Criteria, Facility Arrangement Considerations, Shielding Considerations, System Design Considerations, etc.). Design engineers are responsible for implementing and documenting ALARA design criteria and ALARA design considerations in their work. Supervisors are responsible for ensuring that individuals in the group are trained in ALARA criteria and considerations, and for reviewing designs against those criteria and consideration. The Configuration Management program also requires an ALARA review of proposed changes to the facility.

Periodic interdisciplinary project ALARA reviews are conducted to ensure that ALARA concepts are being integrated into the design and to discuss implementation of the ALARA design goal and the rationale for exceptions from specific ALARA design considerations.

In addition, collective exposure estimates assess projected exposures to provide insight into the sources of exposure and indicate areas that may require additional attention. The estimates are compared to those from similar operating facilities such as the BNFL Sellafield Site.

~~Criteria for the ALARA program are provided in SRD Volume II, Chapter 5.0 "Radiation Protection." Details on the ALARA program are provided in ISAR Section 5.1, "As Low As Is Reasonably Achievable (ALARA) Policy and Program."~~

3) Developing and implementing safe work practices to control the entrance, presence, and exit of subcontractor employees, including their presence in areas of the process covered by the PSM standard

4) Periodically evaluating the performance of subcontractors in fulfilling their obligations as stated

5) Maintaining an illness and injury log relating to the subcontractor work in the process areas.

Each subcontractor's responsibilities include the following:

1) Ensuring that subcontractor employees are trained in the work practices necessary to safely perform their assignments

2) Ensuring that subcontractor employees are instructed in the known hazards of the process as related to their job assignments, and in the relevant provisions of the emergency management plan

3) Documenting that each subcontractor employee has received and understood the training required to work safely at the TWRS-P Facility

4) Ensuring that each subcontractor employee follow the safety rules of the TWRS-P Facility and the site safe work practices, and advise the contractor of any unique hazards presented or found during the course of the subcontractor's work.

BNFL TWRS-P Project environment, safety, and health (ES&H) requirements are imposed on subcontractors in contracting documents. This includes commitments included in the SRD and ISMP. Subcontractors are required to appoint an Licensing, Permitting, and Safety (LPS) representative who is the interface with the BNFL team on all ES&H matters.

Before starting any work, LPS personnel meet with the subcontractor's workers to apprise them of the job-specific ES&H requirements. In addition, oversight is provided of all subcontractor safety and compliance activities.

The system employed on the TWRS-P Project to track subcontractor work includes procedures with detailed checklists and specific record keeping and reporting requirements.

The key elements of this system are subcontractor prequalification, worker job-specific training, day-to-day monitoring, and regular reporting to the contractor. These elements are described in the paragraphs that follow.

The ~~TWRS-P Project~~QAP requires that subcontractors and suppliers providing services and items Important-to-Safety ~~develop a Quality Assurance Program (QAP) that is in compliance with the requirements of 10 CFR 830.120, "Quality Assurance Requirements." and specific to their scope of work. The suppliers~~ submit their ~~QAPs~~ quality plans to ~~the TWRS-P~~ Project QA for review and approval.

The QAP describes how the procurement of items and services is controlled to ensure conformance with specified requirements~~Controls are established by the TWRS-P Project to ensure that purchased items and services conform to the procurement documents~~. Audits of ~~principal~~ suppliers and subcontractors are ~~performed to confirm their QAPs meet the requirements of 10 CFR 830.120, as applicable to their scopes of~~ described in the QAP.

~~work. When the subcontractors are part of the TWRS-P Project integrated team, their work is performed in conformance with the BNFL Inc. TWRS-P Project QAP.~~

Controls are established by the TWRS-P Project to ensure that purchased items and services conform to the procurement documents. These controls include provisions for source evaluation and selection, objective evidence of inspection at the subcontractor's source, examination of items or services upon delivery, and assessments. Verifications of subcontractors' and suppliers' activities during fabrication, inspection, testing, and shipment of materials, equipment, and components are planned and performed with the Quality Assurance organization participation to ensure conformance with the purchase order requirements.

Subcontractors and suppliers develop procedures for the disposition of items, materials, and services that do not meet procurement requirements to ensure that incorrect or defective items, materials, and services are not used in the TWRS-P Facility and that reporting requirements are satisfied. BNFL validates that approved suppliers can continue to provide acceptable items and services based on a documented evaluation of their past performance.

Prequalification. Subcontracting procedures contain subcontract language to ensure that BNFL subcontractors understand their obligation to comply with the TWRS-P Project ES&H programs and procedures and all applicable federal, state, and local requirements. Subcontractors are also required to submit an extensive ES&H history form documenting their capability of meeting these obligations. Subcontractors are also required to submit their safety and health program for BNFL TWRS-P Project review. Before work is carried out, subcontractors are required to validate that their workers have current training for the work activities they are to perform. This training must be documented as quality assurance records.

Day-to-day monitoring. The subcontractor's ES&H performance is measured against their contractual obligations and ES&H performance. This oversight is the responsibility of the project team, which includes ES&H professionals familiar with the subcontractor scope and the specific ES&H project requirements. Instructions for compliance oversight are specified in the BNFL subcontracting procedures and policies. These procedures also contain guidance to initiate contract termination if a subcontractor is found to be in default of these contract obligations, including failure to respond to ES&H infractions.

Regular reporting. Subcontractors maintain their own records of accidents and illnesses and are responsible for notifying BNFL immediately of any lost work day injuries/illnesses, occupational fatalities, OSHA-recordable injuries, hazardous material or radiation exposure, or property damage in excess of $500 occurring in areas under BNFL control. Subcontractors are also responsible for environmental compliance as defined by applicable procedures, regulations, and laws. These submittals are reviewed by ES&H professionals to give BNFL an early warning of performance degradation and to allow BNFL to take effective, preventative action when necessary.

The above approaches are formalized in TWRS-P Project policies, procedures, and instructions. Appropriate training is also provided at all levels including employees, supervisors, and management.

To ensure that BNFL subcontractors are performing their work safely, both formal and informal safety reviews and audits are performed. Results of these evaluations are transmitted to both BNFL TWRS-P Project management and to the affected subcontractors.

8.0 DOCUMENT CONTROL AND MAINTENANCE

The quality assurance program (QAP) requirements for the Tank Waste Remediation System-Privatization (TWRS-P) Project records management system is provided in Section 4~~.0~~, "Documents and Records," of ~~*Tank Waste Remediation System Privatization Project Quality Assurance Program and Implementation Plan*~~the QAP (BNFL ~~1998c~~2000). PC06-Q-0004.1, *QA Document Control*, provides the corporate BNFL policies for document control; QA-01-TWRS, *Project Document Control*, and QA-08-TWRS, *QA Records*, provide specific processes for document and record control. ~~Details on the records management program are described in ISAR Section 3.8, "Records Management."~~

Documents are prepared, reviewed, approved, issued, and revised to prescribe processes, specify requirements, and establish design. Safety documents developed as a part of the safety management process controlled by the QAP include but are not limited to those identified in Table 8-1. The column "Records" lists the documents that address the items in the "Subject" column.

The following sections provide a summary of the more significant aspects of the assessment processes.

10.1 MANAGEMENT ASSESSMENTS

Management assessments are conducted annually by the line manager of each TWRS-P Facility organization to measure the effectiveness of their activities in achieving public and worker safety. The assessments focus on the various functional programs for which managers have safety responsibility.

The assessments cover, but are not limited to the following:

1) Interfaces among groups with safety roles
2) Use of safety performance indicators
3) Adequacy of resources
4) Staff training and qualification
5) Supervisory oversight and support.

Management assessments involve the following:

1) Evaluating the implementation of applicable portions of the quality assurance program

2) Identifying barriers hindering the accomplishment of safety objectives, documenting response actions, and implementing corrective actions

3) Developing a plan for each management assessment that includes the schedule, scope, level of effort, and team qualifications

4) Issuing a final report with identification of problems and corrective actions

5) Evaluating the effectiveness of the corrective actions in preventing recurrences.

Section 9 of the QAP addresses the purpose and conduct of management assessments and specific managers' responsibilities in the assessment process.

10.2 INDEPENDENT ASSESSMENTS

Independent assessments measure the effectiveness of activities in achieving public and worker safety. The staff performing independent assessments have sufficient authority and freedom outside the line organization to carry out their responsibilities. Individuals performing independent assessments are technically qualified and knowledgeable in the areas being assessed. Independent assessments are performed to identify the following:

1) Work performance and process effectiveness

2) Abnormal performance and potential problems

3) Improvement opportunities

4) Effectiveness of root cause identification and corrective actions in preventing recurrence of previous problems

5) Lessons learned from other organizations with similar activities or concerns.

The frequency of the assessments for various functional areas is based on the following:

1) Status, complexity, and importance of the activity or process being assessed

2) Past performance of the activity or process being assessed

3) Performance indicator results and trending to ensure activities are achieving adequate public and worker safety.

Section 10 of the QAP addresses the purpose and conduct of independent assessments, independence and qualifications of assessment personnel, documentation of results, management responses and actions, and specific managers' responsibilities in the assessment process.

10.3 CORRECTIVE ACTION IMPLEMENTATION AND TRACKING

An administrative system is established for tracking corrective action items. Problems are evaluated and trended to determine if any should be reported in an incident report or reported under 10 CFR 820, Procedure Rules for DOE Nuclear Facilities as a significant noncompliance with a nuclear safety requirement. Effectiveness of the corrective actions in preventing recurrence of previous problems is evaluated in a subsequent management assessment.

10.4 SUPPORT OF THE REGULATORY UNIT'S INSPECTION AND CORRECTIVE ACTION/ ENFORCEMENT ACTION PROGRAMS

This section addresses the Regulatory Unit's (RU) inspection and corrective active/enforcement action programs including the BNFL Inc. responsibilities relative to these programs.

10.4.1 Regulatory Unit's Inspection Program

The RU's inspection program is described in *Inspection Program Description for the Regulatory Oversight of TWRS Privatization Contractors,* (DOE-RL 1998b). The purposes of this inspection program are described as:

1) Confirming Contractor performance to the authorization basis and Contract in the areas of radiological, nuclear, and process safety

2) Ensuring timely identification and implementation of corrective actions such that regulatory conditions detrimental to safety and the interests of fixed-price contracting are avoided

3) Developing independent inputs for subsequent regulatory authorization or actions thereby fostering regulatory efficiency.

Consistent with the nature of the fixed-priced contract, the RU inspection program is executed in a planned, disciplined, and predicable manner. This is accomplished through appropriate planning, preparation, and performance of inspections and through the use of established protocols (DOE-RL 1998b).

The TWRS-P Project supports the RU's inspection program by:

1) Making available for RU review, documentation such as program plans, manuals, procedures, instructions, technical reports, self-assessment reports, meeting minutes, records, data reports and event reports

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DOE-RL 1996b, *Top-level Radiological, Nuclear, and Process Safety Standards and Principles for TWRS Privatization Contractors*, DOE/RL-96-0006, Revision 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

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NRC 1977, *Operating Philosophy for Maintaining Occupational Radiation Exposures As Low As Is Reasonably Achievable*, Regulatory Guide 8.10, U.S. Nuclear Regulatory Commission, Washington, D.C.

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